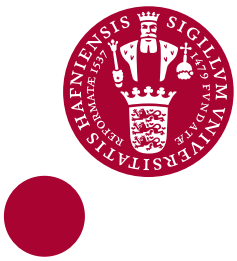


Survival of Salmonella during storage and heating in chocolate

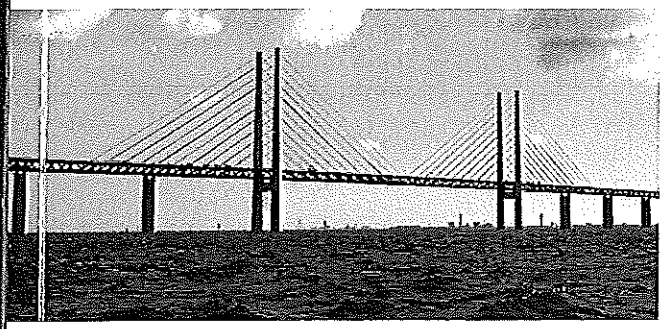
Haxgart, Sine Nygaard; Christensen, Nanna; Knøchel, Susanne; Rønsbo, M.; Nielsen, Dennis Sandris; Heimdal, H.

Published in:
22nd International ICFMH Symposium Food Micro 2010

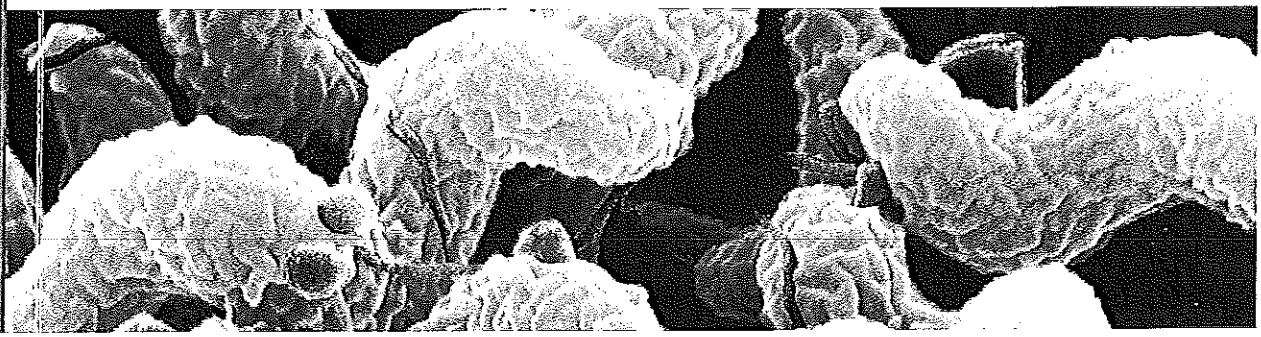
Publication date:
2010

Document version
Early version, also known as pre-print

22nd International ICFMH Symposium Food Micro 2010



Copenhagen 30th August – 3rd September



Final Programme & Abstract Book

FOOD MICRO 2010
Microbial Behaviour in the Food Chain

www.foodmicro.dk

PED2.09 **Efficacy of acidified sodium chlorite against *Listeria monocytogenes* attached to poultry skin during refrigerated storage**

Elena Gonzalez-Fandos (1), B Herrera (1), N Maya (1), C Iñiguez (1)
(1) University of La Rioja, Spain

Raw poultry is a well-recognized source of *Listeria monocytogenes* and many surveys have confirmed the presence of this pathogen on fresh poultry. Some authors have associated cases of listeriosis with the consumption of undercooked chicken. There is a great interest in reducing surface microbial contamination of poultry, with particular regard to reducing the levels of pathogens.

The aim of this study was to evaluate the effect of acidified sodium chlorite washing on the growth of *Listeria monocytogenes* on poultry legs stored at 4ºC for 8 days.

Fresh chickens legs were inoculated with *Listeria monocytogenes*. After the inoculation, the chicken legs were dipped into either a 0.8 g/l , 1 g/l or 1.2 g/l acidified sodium chlorite solution or distilled water (control).

Surface pH values, sensorial characteristics and *L. monocytogenes* and mesophiles counts were evaluated after treatment (day 0) and after 1, 3, 6 and 8 days of storage at 4º C. Significant differences ($p<0.05$) in mesophiles counts were found between the legs treated with acidified sodium chlorite and the control legs. Legs washed with a 1.2 g/l acified sodium chlorite solution showed a significant ($p<0.05$) inhibitory effect on *L. monocytogenes* compared to control legs, being about 1.05 log units lower in the first ones than in control legs after treatment.

After 8 days of storage, *L. monocytogenes* counts were 1.3 log cycles lower in legs treated with 1.2 g/l acidified sodium chlorite than in control ones. Significant reductions in the *L. monocytogenes* populations were also observed on legs treated with 0.8 or 1 g/l of acidified sodium chlorite compared to the control samples.

In conclusion, immersion of chicken legs in a 1.2 g/l acidified sodium chlorite solution can reduce *L. monocytogenes* populations on fresh poultry.

Acknowledgements: The authors thank the Regional Government of La Rioja (Spain) for its financial support (Project Reference ANGI 2005/06).

PED2.10 **Survival of *Salmonella* during storage and heating in chocolate**

S Hoxgart (1), Nanna Christensen (1), S Knøchel (1), M Rønsbo (2), D Nielsen (1), H Heimdal (3),
(1) KU LIFE, IFV, Food Microbiology, Frederiksberg, Denmark
(2) Gate Gourmet, Kastrup, Denmark
(3) Toms Confectionary Group, Ballerup, Denmark

A number of outbreaks caused by *Salmonella* have been linked to food products with low moisture content, including chocolate. This study evaluated the survival of different *Salmonella* in four types of chocolate during conching (a heat-processing step in the manufacture of dark chocolate) and storage for 5 month at 22 ± 1 and 10°C, respectively. A ΔrpoS mutant was included in order to evaluate the importance of rpoS for survival under these conditions, and Salmonella was inoculated at a level of 2•10^7 CFU/g The study was conducted in collaboration with the major Danish chocolate manufacturer Toms Confectionary Group. Survival of *Salmonella* Typhimurium C5 and C5 rpoS was examined in white, milk, 57%, and 72% chocolate at 22 ± 1 and 10°C and during conching of 72% chocolate at 75°C for 22 hours. The survival of *S.* Typhimurim 365, *S.* Oranienburg and *S.* Nigeria (isolated in association with published outbreaks) was examined during storage in milk and 72% chocolate at both storage temperatures. The moisture content was measured for the chocolates. Survival of *Salmonella* during storage was found to be similar regardless of strain and deletion of rpoS. A difference in the log reduction (approx. 0.6 after 5 months) was observed between storage at 22 ± 1 and 10°C, with the latter being the least inhibiting. In all cases the greatest relative log reduction (approx. 2 log) was observed in white or milk chocolate, which also had the highest water content. The moisture content was also found to influence the survival on *Salmonella* during conching. A reduction of 3 log was seen, when *Salmonella* was inoculated at a level of 2x10^7 CFU/g into 72% chocolate and heat treated at 75°C for 22 hours. The inactivation curves of *Salmonella* during conching showed an initial decrease followed by tailing indicating greater persistence of *Salmonella* as the water evaporates. The C5 rpoS was more susceptible to heat than the parent strain.